The Effect of Subliminal Activation of Attitudes towards the Self on Reported Frequencies of Negative Thoughts about the Self

Giuseppe Alfonsi

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ABSTRACT

The effect of subliminal activation of attitudes towards the self on reported frequencies of negative thoughts about the self

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The goal of the present studies was to investigate the relation between attitudes towards the self (i.e., self-esteem) and self-reported frequencies of negative thoughts about the self as measured by the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980). It is argued that participant responses on the ATQ are less likely to be guided, as is commonly thought, by memory retrieval than by reference to participant self-esteem. In Study 1, subliminal presentations of pairs of words were used to activate self-esteem. The presented pair of words consisted of one word referring to the self (i.e, *Me*) and another word that was either a positive (e.g., *Great)* or negative adjective (e.g., *Ugly)*. Self-esteem, frequency of negative thoughts about the self and private self-consciousness was assessed. Contrary to what was hypothesized, no difference was found in self-esteem or reported ideation across priming groups. Unexpectedly, participants presented with positive primes reported higher private self-consciousness that those presented with negative primes. In a replication, a control group was added in which participants were subliminally presented a string of random consonants as opposed to words. No significant differences were observed. The failure to replicate the significant difference for private self-consciousness across priming groups is discussed. Given that self-esteem was not affected, the central hypothesis of the study remains untested. Reasons for the failure of the subliminal priming method as well as alternative approaches for self-esteem activation are discussed.

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Introduction

What happens when individuals are asked to think about their thinking? Such a question can prove quite difficult to answer as it explores arguably the most unique feature of human beings, that being the recursive nature of the human mind. Yet it is people's thinking about thinking that allows them to respond to self-report measures such as questionnaires in a good deal of psychological research. Participants may be asked to appraise some features of their thinking and their responses may be used as a measure of a cognitive construct. But thinking about thinking may not be a straightforward process.

The present research investigates what underlies people's self-report measures of ideation. In particular, it addresses how attitudes towards the self may influence reported frequencies of negative cognition regarding the self in response to the Automatic Thoughts Questionnaire (ATQ; Hollan & Kendall, 1980). The ATQ is a measure of the frequency of negative thoughts about the self. The ATQ lists a series of negative statements (e.g., "I'm no good"). Individuals are asked how often they have had each thought during the preceding week. Presumably, they scan their memory for recent negative thoughts congruent to the items on the sheet and construct an estimate of thought frequency. The ATQ has been used as an objective measurement of negative thought frequency in previous research (Oei, Bullbeck & Campbell, 2006; Aydin, 1997; Olioff, Bryson & Wadden, 1989). For example, Oei, Bullbeck and Campbell (2006) used the ATQ to track changes in frequency of negative thoughts during the course of cognitive-behavioral therapy for depression. Contrary to how the ATQ is presented, it does not seem to me to be very plausible that individuals are able to remember their thoughts in a reliable manner. My hypothesis is that attitudes towards the self shape

participants' responses. Specifically, individuals who have negative attitudes towards the self (i.e., those with low self-esteem) estimate they have more negative thoughts than those with positive attitudes towards the self (i.e., those with high self-esteem). My argument is that attitudes towards the self guide a person's answers on the ATQ because it is difficult to believe that individuals are engaging in memory retrieval of actual instances of these negative thoughts during the preceding week. Previous research has demonstrated that people's recall of their thinking is relatively weaker than that of their actions (Brewer, 1988). My argument is that individuals rely on their general conceptions of themselves to generate responses for how often a particular thought has occurred for them. In particular, my hypothesis is that people rely on their self-esteem in responding to the ATQ. Self-esteem is an evaluative reaction towards the self, and is linked to the self-concept, which is an abstract cognitive representation of the self.

The Self-Concept

The self is a construct of central concern throughout the human sciences. Stretching back to the Delphic injunction of the ancient Greeks to "Know thyself," questions concerning the nature of identity have occupied inquisitive minds for centuries. The self is often used with varied meanings depending on the context in which it is employed. Leary and Tangney (2003) identify five different manners in which the self is commonly used in psychological research: Self as the total person, as personality, as the experiencing subject, as beliefs about oneself, and as the executive agent. The authors note that defining the self in the first two manners as either the total aggregate of parts of an individual or as the total set of traits and dispositions of an individual adds nothing to the scientific lexicon. The words *person* and *personality*, respectively, are already

sufficient to capture these two concepts. Leary and Tangney conclude that the self is best understood as reflecting in different contexts either the phenomenological aspects of self-consciousness, cognitive self-representation, or executive functioning. In other words, it is important to distinguish between the self as subject, the self as object of knowledge, and the self as center of decision-making. In fact, the authors conclude that it is important when discussing the self to determine first which sense of self is of interest.

The self-concept is the set of beliefs individuals form about themselves. As previously mentioned, the self-concept is not the same as the person to whom it belongs. Individuals are not necessarily who they think they are. One's knowledge about oneself was of primary concern for ancient philosophy and since its inception psychological research has also taken up this problem. Attempting to address the nature of self-knowledge is complicated further by the presence of implicit cognition. Much of the processing of individuals' attitudes towards themselves, their peers and their world occur automatically and outside of their awareness (Greenwald & Banaji, 1995). The self-concept that emerges from naïve reflection is neither apodictic nor complete. This can be especially troubling to those psychologists whose research depends primarily on self-report measures. Participants' self-reports might fail to capture elements of themselves that are relatively unconscious. For example, the social identities individuals adopt may influence their judgments and decisions in ways that are inaccessible to their awareness (Devos & Banaji, 2003).

Self-Esteem

Not only do people form a concept of the self, they make judgments about themselves. Self-esteem consists of evaluative responses associated with the self-concept.

Global self-esteem emerges from a number of specific evaluations associated with different domains in the self-concept (Vallacher, Nowak, Froehlich & Rockloff, 2002). Not all parts of the self-concept will elicit evaluation but are shaped by the contingencies of self-worth held by the individual (Crocker & Park, 2003). For instance, it may not matter at all to an individual that he or she is a poor golfer if golf is not relevant to him or her. On the contrary, if that same person is of the opinion that golf is the greatest sport in the world and golfing skill is a sign of worthy character, then this domain in the self-concept will become highly salient for that person's self-esteem. As such, self-esteem can be defined as the sum of all specific judgments about aspects of oneself as a function of contingencies of self-worth.

Another view of self-esteem explains this construct more particularly as an internal measure of one's acceptability to others (Leary & MacDonald, 2003). Self-esteem provides individuals with a felt sense of how they stand relative to some internalized social standard. Leary and MacDonald adopt an evolutionary perspective on self-esteem. Prehistoric human beings would have benefited greatly from being able to estimate their standing in their social group. Alienation from these early social units meant almost certain death. Individuals able to see themselves as an object of evaluation would have been better equipped to maintain their good standing. Therefore, the ability to have a subjective sense of self-worth (i.e., self-esteem) may have been naturally selected for by environmental pressures. Self-esteem in this understanding is the result of a protective process that ensured individuals were motivated to stay interpersonally attractive to their allies.

One of the best examples of the importance of social standing for self-esteem is demonstrated in the classic Morse and Gergen (1970) study. Participants thought they were applying for a job. Prior to the supposed job interview, participants were made to wait in a room with a same aged peer. The same aged peer was in fact a confederate who appeared either highly competent or highly incompetent. The highly competent peer was dressed sharply and appeared to be working. The highly incompetent peer was dressed sloppily and appeared dazed. Participants were asked to complete a self-esteem questionnaire. Being in the same room with a socially desirable peer reduced participants' self-esteem whereas those who waited with a socially undesirable peer showed an increase in self-esteem. Presumably, the participants were re-evaluating their social acceptability against the standard presented by the confederate.

Other research attests to the impact of social acceptability on self-esteem. Subliminal presentations of disapproving pictures of significant others leads to a decrease in individuals' self-esteem (Baldwin, Carrell & Lopez, 1990). The authors of this research argued for the critical role played by relational schemas in self-esteem. In this framework, self-esteem emerges out of a sense of interpersonal acceptability, itself based on contingencies of self-worth. Picking up the example used earlier, it is because the golfer associates positive regard from others as a consequence of golf skill that this domain affects his or her self-esteem.

It is argued that the contingencies individuals form for their self-worth may be tied to the conditions of acceptance they encounter from others (Baldwin, 1997). Further support for this view is provided by the finding that individuals with low self-esteem are quicker to identify acceptance or rejection words if these words are preceded by success

or failure words, respectively (Baldwin & Sinclair, 1996). These findings suggest that individuals with low self-esteem are hypervigilant to cues of contingencies of self-worth. Not only are individuals with low self-esteem hypervigilant, their vigilance appears largely automatic. Success or failure words facilitate the processing of acceptance or rejection words even if the time allotted to the processing task is so small that it precludes deliberative thinking (Baldwin, Baccus & Fitzsimmons, 2004).

Experimental manipulations of Self-Esteem

Self-esteem is open to experimental manipulations. For example, the Morse and Gergen study mentioned above manipulated self-esteem through social comparison. More recent methods have been more subtle in their approach. In one study, participants had to track self-relevant information on a computer screen (Baccus, Baldwin & Packer, 2004). For example, the participant's birthday might appear on the screen. Upon clicking the date, a smiling face would be quickly presented for 400 ms. Exposure to this procedure led to increases in implicit self-esteem. Whereas explicit self-esteem is assessed usually by questionnaires, implicit self-esteem assesses attitudes towards the self in an indirect manner. For example, it is often measured by individuals' degree of preference for letters of the alphabet found in their initials (Koole, Dijksterhuis & van Knippenberg, 2001).

In the Baccus, Baldwin and Packer study, participants were aware of the faces being shown to them and it is unclear what effect this knowledge had on participants' responses. To avoid participant awareness of the goal of the experiment, Riketta and Dauenheimer (2003) developed a means to manipulate self-esteem through subliminal presentations of words. Participants were asked to perform what they thought was a simple vigilance task. They were asked to track a series of flashes on a computer screen.

Unbeknownst to them, the flashes were actually adjectives paired with the word *I* (The actual term was *Ich*; the study was conducted in Germany). The adjectives were either negative (e.g., *Meis* meaning *Lousy* in English) or positive (e.g., *Toll* meaning *Great* in English). The primes were presented for 60 ms in duration, which is below the threshold of awareness. As expected, participants who were presented positive adjectives reported higher self-esteem, as measured by a self-report questionnaire, relative to those who were presented negative adjectives. It was also found that the priming effect did not impact participants' mood, thereby eliminating mood as a confound. The authors argued that the priming procedure influenced self-esteem via a semantic activation process. By this account, the primes act by rendering more accessible information in the self-concept that is congruent to the valence of the presented adjectives. For example, seeing the word *I* repeatedly presented with positive traits makes it easier for participants to conceive of themselves in a positive light because self-enhancing information is made temporarily easier to access.

The principal advantage of the subliminal priming method lies in its unobtrusiveness. Participants are presumably unaware that self-esteem is being experimentally manipulated. A direct manipulation of self-esteem through methods that are transparent to participants can be problematic. Such a manipulation allows for the possibility of the participant surmising the objectives of the experiment. This may compromise the natural and spontaneous behavior of the participant. Also, direct manipulations of self-esteem may produce changes in mood. This can create a confound as it becomes unclear what is due specifically to self-esteem and what is due to the influence of general affect. For example, if positive mood is induced during a self-esteem

experiment, then perhaps this mood will lead individuals to provide a more favorable self-portrayal in completing a self-esteem questionnaire. The subliminal priming method (Riketta & Dauenheimer, 2003) does not alter mood significantly and allows for self-esteem to be affected without participant awareness. This method targets primarily explicit self-esteem but further efforts by researchers have shown that the same priming methods also alter implicit self-esteem (Dijksterhuis, 2004).

The Priming Process

Subliminal manipulations of self-esteem are just one example of the priming process. The effects of priming can be observed when exposure to a piece of information helps an individual to access related information from memory with greater speed. For example, if someone were told it was raining outside, the concept *rain* would cause the concept *umbrella* to become easier to remember. This allows the person to more quickly devise an appropriate plan of action, which in this case would be to get an umbrella to stay dry. More generally, priming occurs when stored information temporarily increases in accessibility as a result of the presentation of a related stimulus (Moskowitz, 2005). Large amounts of information are stored in long-term memory. These bits of information form semantic associations between each other. When a known stimulus is presented to an individual, it triggers a representation in memory. This representation causes other semantically related representations to become temporarily more available for information processing. There is functional value to priming in that it enables the individual to prepare and predict for events in his or her field of experience.

The extent of individuals' susceptibility to priming effects is illustrated by the high speeds of presentation at which these effects still occur. In one experiment

concerned with subliminal psychodynamic activation, participants looked into a visual device where the phrase *MOMMY AND I ARE ONE* was presented for only 4 ms (Weinberger, Kelner and McClelland, 1997). Those who received this message reported significantly more positive mood through free recall than a control group, which the authors interpreted in terms of attachment theory.

Individuals differ in how susceptible they are to primes. In particular, individuals who are higher in private self-consciousness show greater effects in a variety of priming paradigms (Hull, Slone, Meteyer and Matthews, 2002). For example, participants in one study conducted in the U.S. were shown words such as *Florida* or *gray* that were semantically related to the elderly. This was intended to prime slower movement such that individuals who received these primes would walk away from the experiment at a slower pace than those in the control group. This effect was observed. Furthermore, individuals with high private self-consciousness demonstrated greater priming effects than those with low private self-consciousness. Private self-consciousness is a variety of self-focused attention. Individuals high in private self-consciousness are more prone to attend to their own thoughts and feelings. Hull and colleagues concluded that individuals who show more self-focused attention are more likely to encode information as self-relevant, which results in greater susceptibility to priming effects.

Study 1

The present research investigates how self-esteem may impact individuals' responses on self-reported frequencies of self-relevant cognition. It is argued that such self-reports are unlikely the result of episodic memory retrival but probably rely on attitudes towards the self, specifically self-esteem. Given that self-esteem is posited to underlie responses on the ATQ, I adapted the subliminal priming procedure by Riketta and Dauenheimer (2003) to experimentally manipulate self-esteem. The priming procedure provides an excellent means to investigate my hypothesis as it influences self-esteem without the participant's awareness.

A modification was made in keeping with Riketta and Dauenheimer's (2003) recommendations. The authors identified the salience of performance as a possible confound in their method. Participants are being asked to perform what they perceive to be a vigilance task on which their reactions are being measured. This may have led them to enter into the experiment in a more self-focused manner. The authors suggested that participants may experience pride or shame based on their performance and this may have unspecified effects on the priming procedure. For future use of the priming method, the authors suggested framing the procedure in non-performative terms. In keeping with this recommendation, the present research minimized performance elements of the task by informing participants that their responses were not the concern of the experiment. Instead, they were led to believe that their feedback was needed to evaluate the task itself.

An initial study was conducted with two priming conditions. Participants were assigned to either receive primes for negative self-esteem or for positive self-esteem. Participants' self-reports of self-relevant negative thoughts were assessed prior to and

following exposure to the priming procedure. My hypothesis is that self-reported frequencies of negative thoughts about the self are higher for individuals receiving the negative primes than for individuals receiving the positive primes. Additional measures were included to clarify the underlying effects of the priming procedure. Explicit self-esteem measures were included prior to and following the procedure. This was done to confirm that the priming actually activated attitudes towards the self. A mood measure was included to confirm that the manipulation did not cause significant changes in affect. Finally, the private self-consciousness scale (Fenigstein, Scheier & Buss, 1975) was included to examine if private self-consciousness would moderate the priming effect.

Participants

Twenty-five undergraduate students were recruited through a booth located at Concordia University. A sign at the booth announced that participants were needed for a psychology project and that cash prizes could be won. At this booth, students completed a packet of questionnaires which included a contact sheet. Individuals were told prior to responding to the questionnaire that filling out the contact sheet was optional. Students who opted to complete the contact sheet were telephoned over the next two months and asked if they would participate in an experiment. Thirteen women and 11 men chose to participate. Mean age was 24.8 years (range: 18 to 54). All participants were paid $10. A sample size of 25 was employed given the robust effect sizes demonstrated by the priming procedure in previous research (Riketta & Dauenheimer, 2003).

Measures

The Automatic Thoughts Questionnaire(ATQ; Hollan & Kendall, 1980). The ATQ is a 30-item scale designed to measure the frequency of automatic negative

thinking. Each item is a negative statement (e.g., "I'm worthless") for which respondents must indicate how often over the last week they have had that thought. Items are rated on a 5-point Likert scale ranging from *not at all* (1) to *all the time* (5). The ATQ was developed in line with cognitive theories of depression (Hollan & Kendall, 1980). In this etiological model, habitual negative cognition about the self is seen as an underlying cause of depressive episodes (Beck, Rush, Shaw & Emery, 1979). Research does indicate that depressed individuals do report higher frequencies of negative thoughts about the self in responding to the ATQ (Hill, Oei & Hill, 1989). Hollan and Kendall (1980), in developing the ATQ, found it had strong internal consistency (coefficient alpha = .96).

In the present study, two subsets of the ATQ were constructed by dividing the questionnaire in half. These two subsets were administered at 2 separate occasions. For the two subsets, equal numbers of items were randomly assigned from each of the 4 factors identified by Hollan and Kendall (1980). The four factors identified were the following: a) personal maladjustment/desire for change, b) negative self-concept/negative expectations, c) low self-esteem and d) giving up/helplessness.

The first scale, labeled here the ATQ-A (see appendix A), consisted of the following items from the original 30 item scale: Items 1, 6, 7, 10, 11, 12, 15, 17, 19, 21, 24, 26, 27, and 28 (item 30 was omitted due to error). The second scale, labeled here the ATQ-B (see Appendix B), consisted of the following items: Items 2, 3, 4, 5, 8, 9, 13, 14, 16, 18, 20, 22, 23, 25, and 29. Dividing the ATQ into subsets seems feasible as previous shortened forms of the ATQ have demonstrated good psychometric properties (Netemeyer et al., 2002).

The Self-Esteem Scale (SES; Rosenberg, 1965). The SES is a 10-item questionnaire that is designed to measure global self-esteem (see Appendix C). It was originally designed for adolescents but is now used for many different populations (Blascovich & Tomaka, 1991). Five items are positively worded (e.g., "I am able to do things as well as other people") and five items are negatively worded (e.g., "I certainly feel useless at times"). Answers to each item are provided on a 4-point Likert scale ranging from *strongly agree* (1) to *strongly disagree* (4).

In their study on the dimensionality of self-esteem, Fleming and Courtney (1984) conducted an analysis on the psychometric properties of the SES. They found that the SES had strong internal consistency (coefficient alpha = .88) and test-retest reliability (e.g., r = .82). Furthermore, convergent validity was established. The authors found correlations of -.64 with measures of anxiety and -.59 with measures of depression; these two constructs are negatively related to self-esteem. Further convergent validity was demonstrated by the findings that the SES had correlations of .65 with a measure of confidence and .39 with a measure of popularity (Lorr & Wunderlich, 1986).

Questions have been raised as to whether the SES should be seen as measuring unidimensional global self-esteem or rather two dimensions, positive self-esteem and negative self-esteem. Carmines and Zeller (1979, as cited in Marsh, 1996) found that positive and negatively worded items loaded onto separate factors. They hypothesized that there may be two separate dimensions for positive and negative self-regard. They examined how the two SES factors related to a set of 16 external constructs. However, they failed to find differences in how the two factors related to these external measures. This led them to conclude that the two factor solution for the SES can be best understood

as an artifact of item wording. Further research (Marsh, 1996; Tomas & Oliver, 1999) has shown that the SES is best understood as representing the singular construct of global self-esteem, but is subject to method effects related to item wording.

State Self-Esteem Scale (SSES; Heatherton & Polivy, 1991). The SSES is a 20-item scale designed to measure transient changes in self-esteem (see Appendix D). Each item is a self-descriptive statement (e.g., "I feel confident about my abilities"). Respondents rate each item in terms of how true it is for them at the present moment on a 5-point Likert scale ranging from *not at all* (1) to *extremely* (5). Besides producing a single overall score for state self-esteem, the SSES consists of three subscales: performance, social, and appearance self-esteem. Psychometrically, the SSES is quite sound on account of its strong internal consistency (coefficient alpha = .92); (Heatherton & Polivy, 1991). The SSES is a widely used measure for experiments attempting to manipulate self-esteem (Heatherton & Wyland, 2003).

The Positive and Negative Affect Scale (PANAS; Watson, Clark and Tellegen, 1988). The PANAS is a 20-item scale designed to measure positive and negative affect (see Appendix E). Each item consists of an affect term (e.g., "Upset"). There are 10 positive terms and 10 negative terms. The respondent indicates the degree to which they are experiencing each item at the present moment. Answers are given on a 5-point Likert scale ranging from *not at all* (1) to *extremely* (5). Watson, Clark and Tellegen (1988) found that the PANAS measuring immediate mood had strong internal consistency (coefficient alpha = .89 for positive affect scale; coefficient alpha = .89 for negative affect scale). The PANAS also showed appropriate test-retest reliability (correlation= .54 for positive affect scale, correlation= .45 for negative affect scale) since affect should be

only moderately correlated across different measurement times. More recently, Crawford and Henry (2004) found good internal consistency (coefficient alpha = .89 for the positive affect scale; coefficient alpha = .85 for the negative affect scale). As well, Crawford and Henry demonstrated that the PANAS subscales correlate appropriately with measures of depression and anxiety. They concluded that the PANAS is a psychometrically strong measure of mood states.

Private Self-Consciousness Scale (PSCS; Fenigstein, Scheier & Buss, 1975). The PSCS is a 10-item scale designed to measure the degree to which individuals see themselves as self-reflective and introspective (see Appendix F). It is a component of the larger Self-Consciousness Scale but can be administered on its own. Each item is a self-descriptive statement (e.g., "I am alert to changes in my mood"). Respondents rate to what extent each item is characteristic of themselves on a 5-point Likert scale ranging from *extremely uncharacteristic* (0) to *extremely characteristic* (4). Feningstein, Scheier and Buss (1975) reported that the PSCS has strong test-retest reliability (r = .79). Furthermore, the PSCS demonstrates convergent validity through correlations with measures of thoughtfulness and imagery (Turner, Scheier, Carver & Ickes, 1978).

The PSCS was originally conceptualized as representing a singular underlying trait but further research supported the presence of two underlying factors: internal state awareness and self-reflectiveness (Burnkrant & Page, 1984; Mittal & Balasubramanian, 1987). Internal state awareness is the tendency to attend to one's immediate thoughts and feelings. Self-reflectiveness is a general tendency to question oneself regarding one's thoughts and feelings. Self-reflectiveness is associated with dysphoria (Conway, Giannopoulos, Csank & Mendelson, 1993) and low self-esteem (Conway &

Giannopoulos, 1993) indicating it may be a more maladaptive form of self-focused attention than the relatively benign internal state awareness. Other measures exist to capture different facets of self-focused attention (e.g., the Reflection and Rumination Questionnaire, Trapnell & Campbell, 1999) but the PSCS is still commonly used in psychological research.

Procedure

As previously described, a booth was set up at Concordia University. Participants who approached the booth filled out a packet of questionnaires. The packet contained a consent form, a demographics sheet, a contact sheet, the SES, the ATQ-A, and several other questionnaires unrelated to the present study. All psychological measures were presented in counterbalanced order. The SES and ATQ-A provided Time 1 measures of self-esteem and reported frequencies of self-relevant negative cognition, respectively.

Students were contacted for the present study and asked if they would participate. Participants were not selected on the basis on their responses on the pre-measures. However, only individuals who reported fluency in English prior to adolescence were contacted because the priming method was presented in English. Participants were told that the experiment lasted was about 25 minutes in duration and the experimenter booked a convenient time. There was only one participant present at each session. The participant was greeted by the experiment and led into a room containing only a desk, a computer and two chairs. The participant was instructed to sit in the seat directly facing the computer. The experimenter sat in the chair adjacent to the participant. The same script was read to all participants (see Appendix G).

Participants were told that they were participating in a vision experiment. They were going to perform a simple visual task which involved watching for flashes of strings of letters and deciding on which half of the screen they appeared. They were also told that the present experiment was still in development and would require their feedback for further retooling.

Participants were unaware that the flashes actually contained words. The computer program presented an asterisk in the center of the computer screen to orient the participants. Periodic flashes would appear to the upper left, upper right, lower left and lower right of the asterisk. Each flash consisted of two stimuli present in rapid succession though given their rapid presentation, the participants experienced the two stimuli as a single visual object.

The first stimulus was presented for 60 ms (i.e., below conscious threshold). It consisted of two words which were presented one word above the other. The first word was always the word *Me*. The second word was either one of three positive terms (*Good, Great,* or *Smart*) or one of three negative terms (*Bad, Ugly,* or *Dumb*) depending on the group to which the participant had been assigned. The second stimulus appeared immediately after the first stimulus and appeared in the same location as the first to act as a backward mask. This would ensure that the first stimulus did not reach awareness. The second stimulus was presented for 60 ms and consisted of a two line string of random consonants (*HWXFC* and *VPJKZF*). At this point, the program waited for the participants to respond. On each trial, participants had to indicate on which half of the screen the flash had appeared. In sum, each trial consisted of a 60 ms presentation of the word *Me* paired with a trait term followed by a 60 ms mask. Participants were instructed to press the 'F'

key when the flash appeared to the left and the 'J' key when the flash appeared to the right. After any response, the program would present the next trial after an interval of either 1000, 1500, 2000 or 2500 ms. The different intervals were randomly distributed between trials to avoid response set problems. In total, 84 trials were presented. The priming program was created using DirectRT (Version 5.0).

The priming method lasted a few minutes. Afterwards, participants were given a packet of questionnaires. The experimenter told participants that the packet of questionnaires consisted of sets of questions about their thoughts and feelings and this information was being collected for other unrelated research being conducted at the laboratory. This packet included the ATQ-B, the PANAS, and the SSES in counterbalanced order and always ended with the PSCS. Participants completed the questionnaire packet alone in the room and called the experimenter when they finished. At this point, all participants were debriefed and reimbursed for their time.

Results

The observed correlations between measures are reported in Table I. Participants reported the frequency of negative thoughts using the ATQ-A prior to the experiment and the ATQ-B following the priming procedure. The scores on these two questionnaires were standardized so that participants' scores could be compared across time. Similarly, participants' explicit self-esteem was assessed both before the priming procedure using the SES and afterwards using the SSES. As was done for the ATQ, participants' scores were standardized. A separate analysis of variance (ANOVA) with prime condition (positive versus negative primes) and time (prior to versus after the priming) was conducted both for reported frequency of negative thoughts and for explicit self-esteem.

Contrary to expectations, both ANOVAs failed to detect any significant differences, Fs < 1 (see Tables II and III). Participants' responses on the PANAS were analyzed across priming conditions and no significant differences were observed for either positive affect or negative affect, ts < 1. Unexpectedly, for private self-consciousness assessed after priming, a significant difference was found between the positive priming condition (M = 2.98) and the negative priming condition (M = 2.46; $t(22) = 2.68, p = .014$). Participants receiving subliminal presentations of the word *Me* paired with positive adjectives reported themselves as more inwardly focused than did participants presented the negative adjectives. In order to understand what facets of private self-consciousness were involved in this effect, t-tests were performed for each of the subscales of the PSCS. For self-reflectiveness, participants in the positive priming condition scored significantly higher (M = 2.79) than did those in the negative priming condition (M = 2.04; $t(22) = 2.13, p = .044$). No significant difference was observed between priming conditions for internal state awareness ($t(22) = .76, p = .45$).

Participants' responses to the two subsets of the ATQ were highly positively correlated ($r = .85, p < .01$). Both the ATQ-A and the ATQ-B correlated negatively with a pre-measure of self-esteem (i.e., the SES, $r = -.84, p < .01$ and $r = -.76, p < .01$, respectively). Both subsets of the ATQ also correlated negatively with a measure of self-esteem given after the priming procedure (i.e., the SSES, $r = -.87, p < .01$ and $r = -.88$, $p < .01$, respectively). Both subsets correlated positively with negative affect ($r = .59, p < .01$ and $r = .76, p < .01$, respectively). The ATQ-B correlated negatively with a measure of internal state awareness ($r = -.41, p < .05$). The other measures were

correlated in a manner consistent with prior research. Both measures of self-esteem, the SES and SSES, were positively correlated ($r = .79, p < .01$). Both measures of self-

Table I

Intercorrelations between Measures for Study 1

Measure	1	2	3	4	5	6	7	8	9
				Participants (n = 24)					
1.ATQ-A	–	.85**	-.84**	-.87**	-.39	.59**	.13	.32	-.28
2.ATQ-B		–	-.76**	-.88**	-.35	.65**	.11	.37	-.41*
3.SES			–	.79**	.30	-.58**	-.25	-.41*	.19
4.SSES				–	.44*	-.75**	-.31	-.54**	.32
5.PA					–	-.14	-.13	-.20	.23
6.NA						–	.32	.37	.03
7.PSCS							–	.85**	.56**
8.SR								–	.11
9.ISA									–

Note. ATQ = Automatic Thoughts Questionnaire, SES = Self-Esteem Scale, SSES = State Self-Esteem Scale, PA = Positive Affect subscale of the PANAS, NA = Negative Affect subscale of the PANAS, PSCS= Private Self-Consciousness Scale, SR = Self-Reflectiveness subscale of the PSCS, ISA = Internal State Awareness subscale of the PSCS. For all measures, higher numbers indicate more of the respective construct.
* $p < .05$, ** $p < .01$

Table II

Analysis of Variance for Priming and Time on Standardized Scores on Reported Automatic Thoughts in Study 1

Source	Sum of Squares	*df*	Mean Square	*F*	P
		Between Subjects			
Prime (P)	0.001	1	0.001	0.001	.98
S within-group error	42.52	22	1.93		
		Within Subjects			
Time (T)	0.00	1	0.00	0.00	1.00
T x P	0.025	1	0.025	0.16	.69
T x S within-group error	3.45	22	.16		

Table III

Analysis of Variance for Priming and Time on Standardized Scores of Self-Esteem in Study 1

Source	Sum of Squares	*df*	Mean Square	*F*	P
		Between Subjects			
Prime (P)	0.507	1	0.507	0.28	.61
S within-group error	40.58	22	1.85		
		Within Subjects			
Time (T)	0.00	1	0.00	0.00	1.00
T x P	0.002	1	0.002	0.011	.92
T x S within-group error	4.91	22	.22		

esteem (the SES and SSES) correlated negatively with negative affect ($r = -.58, p < .01$ and $r = -.75, p < .01$, respectively) and with self-reflectiveness ($r = -.41, p < .05$ and $r = -.54, p < .01$, respectively). However, only the SSES correlated positively with positive affect ($r = .44, p < .05$).

Discussion

The results of Study 1 were not consistent with expectations. The proposed priming method failed to produce significant differences in explicit self-esteem as well as in reported frequencies of negative cognition. The expectation was that changes in attitudes towards the self would affect participants' responses on the Automatic Thoughts Questionnaire. Since the priming procedure failed to affect self-reported self-esteem, the central hypothesis remains untested. This is unfortunate as the priming method used would have been a useful method to alter self-esteem without raising the awareness of participants.

A measure of private self-consciousness was included to determine whether this construct would affect the strength of priming effects. Participants' private self-consciousness scores were not expected to be influenced by the priming method. Nevertheless, a difference in private self-consciousness emerged. Participants who received primes aimed at raising their self-esteem described themselves as more likely to think about their thoughts and feelings than those who received primes aimed at lowering self-esteem Given the unexpectedness of the results, it is unclear whether there were pre-existing differences in participants' private self-consciousness between the two priming conditions or whether the priming procedure itself influenced participants' self-consciousness. It is possible that the priming procedure may have influenced participants'

sense of their own self-reflectiveness. This is a difficult result to explain given a lack of existing research describing such effects. The lack of a control group presented a further problem in interpreting the observed differences in self-consciousness scores. It was unclear whether negative priming had decreased reported private self-consciousness, whether positive priming had increased reported private self-consciousness or both changes were occurring.

Study 2

In order to confirm the findings on private self-consciousness, Study 1 was replicated with some modifications. It was decided that a control group was to be added. In Study 2, participants were randomly assigned to one of three conditions: positive priming, negative priming, or the control group. The hypothesis was that the findings would replicate Study 1, whereby the priming method would affect participants' private self-consciousness. In Study 2, another goal was to once again test the central hypothesis that priming could affect participants' reported frequency of negative thoughts about the self by influencing self-esteem. In Study 2, the positive and negative prime conditions match those of Study 1 with the exception that no pre-measures were taken in Study 2. In the control condition, participants were to receive a string of random consonants as their priming stimulus instead of the pair of words.

Given the priming effect on self-focused attention in Study 1, a second measure of self-focused attention, the Reflection Rumination Questionnaire (RRQ; Trapnell & Campbell, 1999) was included. The RRQ was designed to measure self-focused attention that distinguished benign self searching from maladaptive internal focus. In comparison to the RRQ, the PSCS does not clearly distinguish between these two orientations. For example, the two sub-scales of the PSCS, self-reflection and internal state awareness both correlate with openness to new experience but only self-reflection correlates with neuroticism (Trapnell & Campbell, 1999). These types of findings led Trapnell and Campbell to develop a measure that could differentiate between the different components of self-focused attention. They seemed successful in that attempt. For example, only the

reflection subscale of the RRQ correlates with openness to new experience and only the rumination subscale of the RRQ correlates with neuroticism.

Participants

Thirty-nine students were recruited from classes at Concordia University. In these classes, the experimenter announced that participants were needed for a psychology experiment. Students who were interested left their name and number on a contact sheet. Those who had expressed interest were telephoned by the experimenter. The sample was composed of 29 women and 10 men. Mean age was 23.9 years (range: 18 to 48). Participants were paid $10.

Measures

The Reflection Rumination Questionnaire(RRQ; Trapnell & Campbell, 1999). The RRQ is a 24-item questionnaire (see Appendix H) designed to measure the tendency to look inward in a playful quest for self-understanding (Reflection) versus a compulsive focus on one's negative thoughts and feelings (Rumination). The items are self-descriptive statements (e.g., "My attention is often focused on aspects of myself I wish I'd stop thinking about"). Participants are asked to indicate how characteristic each item is of themselves on a 5-point Likert scale ranging from *not at all* (1) to *extremely* (5). The RRQ demonstrates good internal consistency (coefficient alpha = .91 for the reflection subscale, coefficient alpha = .90 for the rumination subscale) and is psychometrically sound (Trapnell & Campbell, 1999).

Other measures As in Study 1, measures of frequencies of negative ideation about the self (ATQ-B), of explicit self-esteem (SSES), of mood (PANAS), and of private self-consciousness (PSCS) were included in a packet of questionnaires given to participants

upon completion of the computer task.

Procedure

The procedure for Study 2 was identical to Study 1 except for the following two changes. First, as noted above, a control condition was added. In this condition, during the priming phase of the sequence of stimuli, instead of being presented the word *Me* and an evaluative term, participants were exposed to a string of random consonants for 60 ms. Second, the RRQ was included in the packet of questionnaires completed after the priming procedure. The RRQ was always placed last in the sequence of questionnaires.

Results

The observed correlations between measures are reported in Table IV. A series of one-way ANOVAs was conducted. An initial one-way ANOVA was performed to determine whether there was a significant effect of priming condition on the self-reflectiveness scale of the PSCS. Contrary to what was observed in Study 1, no significant effect of priming condition for self-reflectivenss was found (see Table V). Nor was there a significant effect of priming condition on overall private self-consciousness scores (see Table VI). Furthermore no significant effects of priming were found for the reflection (see Table VII) or rumination (see Table VIII) subscales of the RRQ. As in Study 1, there was no significant effect of priming condition on either explicit self-esteem (see Table IX) or reported negative ideation about the self (see Table X). No significant effects of priming condition were found for internal state awareness (see Table XI), positive affect (see Table XII), or negative affect (see Table XIII). In summary, no significant differences were found whatsoever.

The observed correlations between measures were consistent with prior research.

Table IV

Intercorrelations between Measures for Study 2

Measure	1	2	3	4	5	6	7	8	9
				Participants (n = 39)					
1.ATQ	–	-.16	.40*	-.61**	.21	.38*	-.12	.53**	.12
2.PA		–	.10	.24	.04	-.11	.27	-.27	.08
3.NA			–	-.30	.08	.10	.01	.16	.32*
4.SSES				–	-.13	-.28	.14	-.30	-.10
5.PSCS					–	.85**	.72**	.23	.63**
6.SR						–	.33*	.42**	.50**
7.ISA							–	-.19	.54**
8.RU								–	.07
9.RF									–

Note. ATQ = Automatic Thoughts Questionnaire, PA = Positive Affect subscale of the PANAS, NA = Negative Affect subscale of the PANAS, SSES = State Self-Esteem Scale, PSCS= Private Self-Consciousness Scale, SR = Self-Reflectiveness subscale of the PSCS, ISA = Internal State Awareness subscale of the PSCS, RF = Reflection subscale of the RRQ, RU = Rumination subscale of the RRQ. For all measures, higher numbers indicate more of the respective construct.
* $p < .05$; ** $p < .01$

Table V

Analysis of Variance across Priming Conditions on Self-Reflectiveness in Study 2

Source	Sum of squares	*df*	Mean Square	*F*	*p*
Between Groups	0.15	2	0.077	0.11	.90
Within Groups	26.27	36	0.73		
Total	26.42	38			

Table VI

Analysis of Variance across Priming Conditions on Private Self-Consciousness in Study 2

Source	Sum of squares	*df*	Mean Square	*F*	*p*
Between Groups	0.011	2	0.005	0.015	.99
Within Groups	12.88	36	0.36		
Total	12.89	38			

Table VII

Analysis of Variance across Priming Conditions on Reflection in Study 2

Source	Sum of squares	*df*	Mean Square	*F*	*p*
Between Groups	0.34	2	0.17	0.29	.75
Within Groups	20.76	36	0.58		
Total	21.10	38			

Table VIII

Analysis of Variance across Priming Conditions on Rumination in Study 2

Source	Sum of squares	*df*	Mean Square	*F*	*p*
Between Groups	0.16	2	0.078	0.15	.86
Within Groups	19.01	36	0.53		
Total	19.17	38			

Table IX

Analysis of Variance across Priming Conditions on Self-Esteem in Study 2

Source	Sum of squares	*df*	Mean Square	*F*	*p*
Between Groups	0.084	2	0.042	0.12	.89
Within Groups	12.70	36	0.35		
Total	12.79	38			

Table X

Analysis of Variance across Priming Conditions on Reported Frequencies of Negative Thoughts about the Self in Study 2

Source	Sum of squares	*df*	Mean Square	*F*	*p*
Between Groups	0.034	2	0.017	0.051	.95
Within Groups	12.05	36	0.34		
Total	12.09	38			

Table XI

Analysis of Variance across Priming Conditions on Internal State Awareness in Study 2

Source	Sum of squares	*df*	Mean Square	*F*	*p*
Between Groups	0.042	2	0.021	0.04	.96
Within Groups	18.80	36	0.52		
Total	18.84	38			

Table XII

Analysis of Variance across Priming Conditions on Positive Affect in Study 2

Source	Sum of squares	*df*	Mean Square	*F*	*p*
Between Groups	0.99	2	0.50	1.15	.33
Within Groups	15.61	36	0.43		
Total	16.60	38			

Table XIII

Analysis of Variance across Priming Conditions on Negative Affect in Study 2

Source	Sum of squares	*df*	Mean Square	*F*	*p*
Between Groups	0.004	2	0.002	0.006	.99
Within Groups	11.68	36	0.32		
Total	11.68	38			

The ATQ correlated positively with negative affect ($r = .40, p < .05$), negatively with self-esteem ($r = -.61, p < .01$), positively with self-reflectiveness as measured by the PSCS ($r = .38, p < .05$) and positively with rumination as measured by the RRQ ($r = .53$, $p < .01$). Negative affect correlated positively with reflection as measured by the RRQ ($r = .32, p < .05$). The PSCS correlated positively with the reflection subscale of the RRQ ($r = .63, p < .01$). Self-reflectiveness correlated positively with internal state awareness ($r = .33, p < .05$) as well as with both subscales of the RRQ, rumination ($r = .42, p < .01$) and reflection ($r = .50, p < .01$). Internal state awareness correlated positively with the reflection subscale of the RRQ ($r = .54, p < .01$).

Discussion

Study 2 was conducted in order to examine whether the differences observed in Study 1 across priming conditions in private self-consciousness could be replicated. Furthermore, Study 2 provided another opportunity to examine if priming condition could influence reported negative ideation about the self through activation of attitudes towards the self (i.e., self-esteem). Using the same priming method as in Study 1, no significant effects were found in study 2. The significant effect of priming on private self-consciousness failed to replicate. In fact, the differences between priming groups for the measures of private self-consciousness and the related constructs of reflection and rumination appeared negligible. It does not appear that with more participants the previously observed significant difference would reemerge and so the failure to replicate is unlikely to be due to a lack of power. Once again, no significant effects of priming were found on self-esteem despite previous research demonstrating a medium to strong effect of the priming method on reported self-esteem (Riketta & Dauenheimer, 2003).

General Discussion

Much research in psychology relies on people's ability to report the frequency of their thoughts over a specified period of time, be it a day, week, month, etc. The assumption underlying this kind of research is that people are able to accurately assess the frequency of their own thoughts. However, this assumption can be called into question. Perhaps unrelated processes may influence such self-reports. The present research examined one such mechanism that could account for individuals' reports of thoughts about the self. It was hypothesized that people rely on their attitudes toward the self (i.e., self-esteem) when asked to report how often they experience negative thoughts about the self.

This research attempted to investigate the relation between attitudes towards the self and the ATQ by way of a subliminal manipulation. Participants were exposed to a 60 ms flash of either positive traits or negative traits accompanied by the self-referring word *Me*. It was hypothesized at first that the positive trait group would have reported higher self-esteem and lower automatic negative thoughts than the negative group. This failed to occur in either study performed. At the end of Study 1, an unexpected result emerged. The positive prime condition reported greater self-reflectiveness than the negative prime condition. This result failed to replicate in Study 2 despite the inclusion of a second measure of self-focused attention. This would suggest that the significant difference in self-reflectiveness in Study 1 was most likely due to chance. This conclusion seems likely given both the unexpectedness of the significant difference between priming conditions on private self-consciousness in Study 1 and the failure to replicate this result in Study 2.

Unfortunately, the manipulation performed in this research turned out to be ineffective. This comes as a surprise as previous studies utilizing the same methodology obtained significant results. As a consequence of the failure of the subliminal manipulation to activate attitudes towards the self, the central hypothesis presented in this thesis remains largely untested. Attitudes towards the self may still underlie participants' responses on the ATQ. However, to support this contention, a method to systematically alter those attitudes while measuring reported frequencies of negative thoughts will need to be developed. It is also unfortunate given that the methodology used in this study was supposedly able to activate attitudes towards the self without alerting participants to that fact. Thus, the subliminal presentation could provide information on attitudes toward the self and their effects on responses to the ATQ without much interference from self-presentation concerns on the part of participants.

It is first worth asking whether a subliminal manipulation of self-esteem can be effective. Two research reports were presented that showed that subliminal presentations of pairings of self-referents and trait terms could influence self esteem (Riketta & Dauenheimer, 2003; Dijksterhuis, 2004). It would be difficult to argue that these results are spurious given both papers present several replications of their findings. Furthermore, these researchers produce results with robust effect sizes whereas the studies presented in this research seemed to show next to no differences at all, let alone significant ones. It is unlikely such sizeable effects with repeated replications are illusory but the possibility is still worth mentioning. It is more advantageous to consider that the priming method failed specifically in the context of this research and to conceptualize what were the specific differences between past research and the present studies.

In asking why this method failed for the sample used in this research, three possibilities emerge. First, priming studies may be sensitive to unknown experimental parameters not always included in the procedure presented in published research reports. Second, some changes were made to the methodology that seemed minor but they may have rendered the manipulation ineffective. Third, the participants used in the present research were relatively more culturally heterogeneous than that of the previous research in which the manipulation was effective. Perhaps, one or more of these factors may have caused the method to fail.

Subliminal priming is by its nature a sensitive experimental manipulation. The very fact that such subliminal presentations are not amenable to conscious awareness demonstrates the power subtle influences may have on participant behavior. It is possible that some unmentioned parameter lies behind the effect sought in this research, namely activation of attitudes towards the self. Some feature perhaps of the computer on which they were shown, or perhaps in the demeanor of the experimenter may have proved a necessary precondition to the success of the priming method. This possibility cannot easily be dismissed. The effects are generated from such rapid presentations of words that on the face of things, it is not surprising that the effects may prove difficult to reproduce outside the original experimental context.

The procedure used was altered in two respects from the original study. These alterations may have negated the priming effect. First, the self-referent in the original study was the German word *Ich* which translates as *I*. The word *Me* was chosen for this research as opposed to the word *I* because *I* has multiple meanings. It can represent the self, the letter 'I' or the Roman numeral indicating one. Given the short presentation of

the words, *Me* seemed less ambiguous than *I* to use as a prime to activate the self. Contrary to my expectations, perhaps the word *Me* is not an effective self-referent to use as a prime. Future attempts at replicating the priming method in English might want to use the word *I* instead to determine if this is necessary for activation of attitudes towards the self.

In the cover story offered for the experiment, the original authors (Riketta & Dauenheimer, 2003) told participants that they were about to engage in a vigilance task. In their discussion section, the authors voiced concerns that framing the experiment in these performative terms might cause participants to judge themselves on how well they completed the task and that is was unclear what effects that might have. They suggested describing the study in other terms so as to eliminate performance aspects of the experiment as a confound. In the present research, participants were told that they were engaged in a vision study. The task at hand was to develop a program that could help to investigate visual thresholds. The program participants were using was described as a work in progress and their feedback would be helpful. This served to shift participants' evaluation away from their own performance to the usefulness of the computer task itself. This may have negated the effects of the priming method. Perhaps a performative mindset is necessary to render participants susceptible to the prime. Alternatively, perhaps participants' evaluations of the program interfered with activation of attitudes towards the self. Whatever the case, this change in the procedure is another possible cause for the failure of the present research to replicate the priming effect.

The sample used for the present research was drawn from the undergraduate population at Concordia University in Montreal, Canada. This population is largely

bilingual and heterogeneous in cultural make-up. Only students who reported developing fluency in English prior to adolescence were recruited for the studies. But this still included quite a few allophones and bilinguals for whom English may be a second language, albeit one that they have mastered for most of their lives. It is likely that Riketta and Dauenheimer (2003) developed the priming procedure using a much more homogenous population, linguistically and culturally, at the University of Mannheim in Germany. Differences in how culturally homogenous a population was used may have had great impact on a subliminal priming procedure using words. It is unclear whether verbal primes will be effective with such a quick presentation if those words are in a second language for the participant. Ideally, future attempts at using this priming method would use culturally homogenous English first language speakers but such constraints are difficult and costly to impose for the population used in this research. It is unclear if greater cultural variance is the reason the priming method failed but it may be worth future investigation.

The failure of the priming method used in this research is unfortunate because the central hypothesis of the present research remain untested. It was hypothesized that participants' responses on the ATQ are, in part, the reflection of general attitudes towards the self. In searching for alternate methods to test this hypothesis, a wide variety of manipulations to self-esteem are possible. Ideally, a subliminal manipulation is preferred because it does not alert participants to the goals of the research in which they are involved. But if such manipulations prove difficult, then it may be worthwhile to use more overt methods to manipulate self-esteem.

Multiple methods exist to manipulate self-esteem, some of which have already been mentioned. Individuals could be primed with disapproving faces of significant others (Baldwin, Carrell & Lopez, 1990). Individuals could have self-relevant information such as their birthday repeatedly paired with subliminally presented frowning faces (Baccus, Baldwin & Parker, 2004). Individuals could be placed in rooms with individuals whom are made out to seem either more or less socially competent (Morse & Gergen, 1970). Other methods not previously mentioned include giving feedback on a personality test (Greenberg & Pyszczynski, 1985) or on an assigned task (Ybarra, 1999) to participants to temporarily raise or lower self-esteem. There are many possible routes to activate attitudes towards the self. Completing the ATQ after these interventions may be useful to answer the questions addressed in this research though each method has its own relative strengths and weaknesses. It was an attempt to find a minimally intrusive method to alter self-esteem that lead to settling on the subliminal presentations of words for this study. But it has turned out that such a method does not work in the context of the present research.

The self-representation of thought is an intriguingly complex process. The present research has tried to map out the key themes that should be kept in mind when considering how individuals think about their thinking. Three major points are worth reiterating. Thinking about thinking is a complex process. This process is likely to be a reflection of individuals' general evaluations and beliefs about themselves. Self-report measures of thinking are better understood as representing these self same general evaluations and beliefs. These three points are not meant to breed pessimism in for those interested in pursuing research built on self-report measures. Questionnaires still generate

a great deal of useful information. They may provide researchers with a useful assessment of how respondents view themselves. This is invaluable information for answering a wide variety of questions. If however, the thinking processes themselves are under investigation, directly asking a participant to quantify these processes is at best questionable and at worst quixotic. In asking individuals to describe themselves, the answers provided are generated through the lens of their own self-attitudes, and there is no guarantee that this lens is free of distortion.

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APPENDIX A

The Automatic Thoughts Questionnaire (Version A)

ATQ-A

Listed below are a variety of thoughts that pop into people's heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you over the last week. Please read each item carefully and circle the number on the scale that indicates how frequently the thought has occurred to you.

I feel like I'm up against the world.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I don't think I can go on.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I wish I were a better person.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I'm so disappointed in myself.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

Nothing feels good anymore.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I can't get started.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I wish I were somewhere else.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I hate myself

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I wish I could just disappear.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I'm a loser.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I'll never make it.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

Something has to change.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

There must be something wrong with me.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

My future is bleak.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

APPENDIX B

The Automatic Thoughts Questionnaire (Version B)

ATQ-B

Listed below are a variety of thoughts that pop into people's heads. Please read each thought and indicate how frequently, if at all, the thought occurred to you **over the last week**. Please read each item carefully and circle the number on the scale that indicates how frequently the thought has occurred to you.

I'm no good.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

Why can't I ever succeed?

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

No one understands me.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I've let people down.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I'm so weak.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

My life's not going the way I want it to.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I can't stand this anymore.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

What's wrong with me?

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I can't get things together.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I'm worthless.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

What's the matter with me?

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

My life is a mess.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I'm a failure.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

I feel so helpless.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

It's just not worth it.

1	2	3	4	5
not at all	sometimes	moderately often	often	all the time

APPENDIX C

The Rosenberg Self-Esteem Scale

RSES

Respond to each of the statements below by choosing the rating you feel most closely represents you

1. I feel that I'm a person of worth, at least on an equal plane with others.

1	2	3	4
strongly agree	agree	disagree	strongly disagree

2. I feel that I have a number of good qualities.

1	2	3	4
strongly agree	agree	disagree	strongly disagree

3. All in all, I am inclined to feel that I am a failure.

1	2	3	4
strongly agree	agree	disagree	strongly disagree

4. I am able to do things as well as most other people.

1	2	3	4
strongly agree	agree	disagree	strongly disagree

5. I feel I do not have much to be proud of.

1	2	3	4
strongly agree	agree	disagree	strongly disagree

6. I take a positive attitude toward myself.

1	2	3	4
strongly agree	agree	disagree	strongly disagree

7. On the whole, I am satisfied with myself.

1	2	3	4
strongly agree	agree	disagree	strongly disagree

8. I wish I could have more respect for myself.

1	2	3	4
strongly agree	agree	disagree	strongly disagree

9. I certainly feel useless at times.

1	2	3	4
strongly agree	agree	disagree	strongly disagree

10. At times I think I am no good at all.

1	2	3	4
strongly agree	agree	disagree	strongly disagree

APPENDIX D

The State Self-Esteem Scale

Current Thoughts Scale

This is a questionnaire designed to measure what you are thinking at this moment. There is, of course, no right answer for any statement. The best answer is what you feel is true of yourself at this moment. Be sure to answer all of the items, even if you are not certain of the best answer. Again, answer these questions as they are true for you **RIGHT NOW** by circling the number in the scales the below.

1. I feel confident about my abilities.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

2. I am worried about whether I am regarded as a success or failure.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

3. I feel satisfied with the way my body looks right now.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

4. I feel frustrated or rattled about my performance.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

5. I feel that I am having trouble understanding things that I read.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

6. I feel that others respect and admire me.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

7. I am dissatisfied with my weight.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

8. I feel self-conscious.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

9. I feel as smart as others.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

10. I feel displeased with myself.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

11. I feel good about myself.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

12. I am pleased with my appearance right now.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

13. I am worried about what other people think of me.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

14. I feel confident that I understand things.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

15. I feel inferior to others at this moment.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

16. I feel unattractive.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

17. I feel concerned about the impression I am making.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

18. I feel that I have less scholastic ability right now than others.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

19. I feel like I'm not doing well.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

20. I am worried about looking foolish.

1	2	3	4	5
Not at all	a little bit	somewhat	very much	extremely

APPENDIX E

The Positive and Negative Affect Scale

PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer in the space below each item. Indicate to what extent you feel this way right now, that is, at the **present moment.** Use the following scale to record your answers:

1. Interested				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely
2. Distressed				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely
3. Excited				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely
4. Upset				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely
5. Strong				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely
6. Guilty				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely
7. Scared				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely
8. Hostile				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely
9. Enthusiastic				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely
10. Proud				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely
11. Irritable				
1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

12. Alert

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

13. Ashamed

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

14. Inspired

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

15. Nervous

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

16. Determined

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

17. Attentive

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

18. Jittery

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

19. Active

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

20. Afraid

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

APPENDIX F

The Private Self-Consciousness Scale

In this questionnaire, we are interested in finding out how you feel about yourself. Please think about how much each statement is characteristic of you or is not characteristic of you. Rate a statement as characteristic if you feel it describes what you typically do or how you typically think or feel.

1. I am always trying to figure myself out.

0	1	2	3	4
extremely uncharacteristic				extremely characteristic

2. Generally, I'm not very aware of myself.

0	1	2	3	4
extremely uncharacteristic				extremely characteristic

3. I reflect about myself a lot.

0	1	2	3	4
extremely uncharacteristic				extremely characteristic

4. I'm often the subject of my own fantasies.

0	1	2	3	4
extremely uncharacteristic				extremely characteristic

5. I never scrutinize myself.

0	1	2	3	4
extremely uncharacteristic				extremely characteristic

6. I'm generally attentive to my inner feelings.

0	1	2	3	4
extremely uncharacteristic				extremely characteristic

7. I'm constantly examining my motives.

0	1	2	3	4
extremely uncharacteristic				extremely characteristic

8. I sometimes have the feeling that I'm off somewhere watching myself.

0	1	2	3	4
extremely uncharacteristic				extremely characteristic

9. I'm alert to changes in my mood.

0	1	2	3	4
extremely uncharacteristic				extremely characteristic

10. I'm aware of the way my mind works when I work through a problem.

0	1	2	3	4
extremely uncharacteristic				extremely characteristic

APPENDIX G

Cover Story for Participants,

Studies 1 and 2

Cover Story for Subjects in Studies 1 and 2

Let me give you a bit of background to this study before we begin. Vision is an area of great interest in psychology. For the eye to function and allow us to see the world in which we live, our brains and our minds need to perform many complex functions. Think about how much goes into seeing a simple object like a tree before you. Your brain instantaneously uses information from your eye to calculate the shape of the tree, its approximate distance from you, the different colors that it is made of, its shade, and this all happens in a split second. Vision psychologists are interested in understanding all these different tasks and seeing how we are able to do all this.

The power of sight as already mentioned is very complex and we as psychology researchers are always seeking to develop new methods of learning more about vision. Some experiments in the past have looked at the issue of light intensity, the amount of light needed to be able to see something. It is interesting to see what the very limits of sight are and how we are able to turn very little light into an image in our mind. Others have looked at how we are able to turn raw information at the level of the eye into something like a moving object. If you think of a car for instance driving past you, your mind is able to turn a collection of bits and parts into a unified image of a car moving. Another area worth looking at is recognition. Not only do we see the world, but we are able to recognize different parts within the whole. If I tell you to look for an object like a cat in your garden, your eyes are able to scan over the area and your brain can rather quickly seek out the animal and find it amongst many other objects. This is really complex if you imagine trying to build a machine that could do the same. The difficulty

lies in trying to understand all the relevant tasks your brain has to complete before it can accomplish its main goal of finding a desired object.

In the research that I am doing, I am particularly interested in looking at how people find objects in a fast paced situation. To do this I am trying to develop a computer program that can investigate the eye's ability to locate fast-paced presentations of a visual image. It is not necessarily clear whether the program I have today is able to do this in the way I want it to. Perhaps it is too simple or perhaps it is too hard. I need to test the program I developed to see if it is suitable for the kinds of questions that I am asking. You can help me by trying your best and telling me afterwards what you thought of the experiment. Your feedback will be useful. Your opinion and that of other participants will help to decide on how I am going to proceed in this research.

I am going to ask you to watch the computer screen upon which flashes will appear to the left or right of the center. You will answer on which half the screen they are appearing using the keyboard. Afterwards, I am going to have you fill out a set of questionnaires. I have a consent form I would like you to read over and if you agree to the terms contained within, you may choose to sign it.

At this point I would like to describe in more detail the visual task. The flashes you will have to find on the screen will be random groups of letters. The task involves locating the group of letters on the screen quickly. There will be a star located in the center of the screen. The group of letters will appear sometimes to the left and sometimes to the right of the star. You will answer using the two keys marked with green stickers. I am going to ask you to press the left key when the flash appears to the left. Press the right key whenever the flash appears to the right. We are just about ready to begin. You can

put your index fingers on the green keys. Hear let me show you how. Is that comfortable? Is that well placed? Is there any questions? You should try to respond as both as quickly and as accurately as you can. Once I leave, press the spacebar to continue. I'll be on my way now. I'll be just down the hall.

APPENDIX H

The Reflection and Rumination Questionnaire

RRQ

Please read each of the following statements. Indicate how much each statement is characteristic of you by circling one of the five possible answers.

1. My attention is often focused on aspects of myself I wish I'd stop. thinking about

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

2. I always seem to be "re-hashing" in my mind recent things I've said. or done

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

3. Sometimes it is hard for me to shut off thoughts about myself.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

4. Long after an argument or disagreement is over with, my thoughts keep going back to what happened.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

5. I tend to "ruminate" or dwell over things that happen to me for a really long time afterward.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

6. I don't waste time re-thinking things that are over and done with.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

7. Often I'm playing back over in my mind how I acted in a past situation.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

8. I often find myself re-evaluating something I've done.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

9. I never ruminate or dwell on myself for very long.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

10. It is easy for me to put unwanted thoughts out of my mind.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

11. I often reflect on episodes in my life that I should no longer concern myself with.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

12. I spend a great deal of time thinking back over my embarrassing or disappointing moments.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

13. Philosophical or abstract thinking doesn't appeal to me that much.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

14. I'm not really a meditative type of person.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

15. I love exploring my "inner" self.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

16. My attitudes and feelings about things fascinate me.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

17. I don't really care for introspective or self-reflective thinking.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

18. I love analyzing why I do things.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

19. People often say I'm a "deep", introspective type of person.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

20. I don't care much for self-analysis.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

21. I'm very self-inquisitive by nature.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

22. I love to meditate on the nature and meaning of things.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

23. I often love to look at my life in philosophical ways.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely

24. Contemplating myself isn't my idea of fun.

1	2	3	4	5
Not at all	a little bit	moderately	quite a bit	extremely